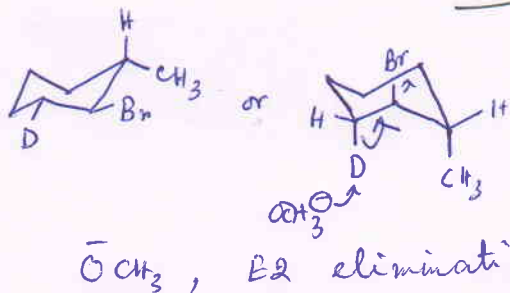
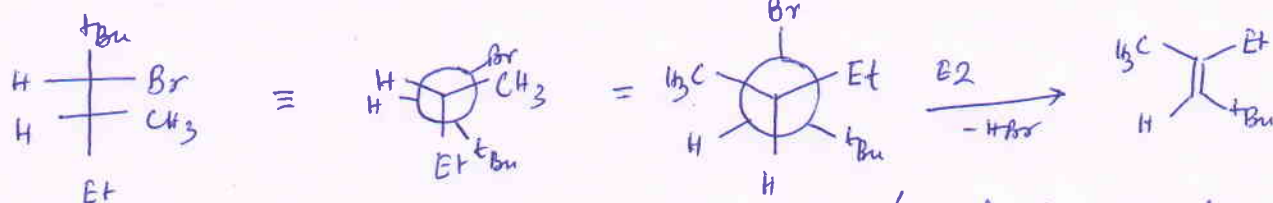


1.



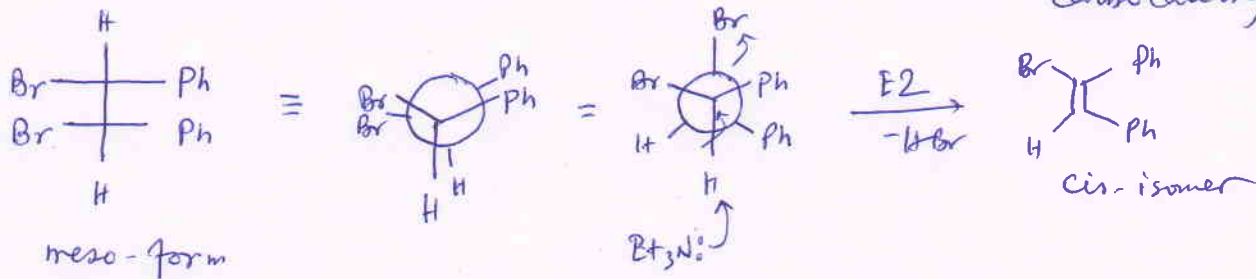
From these conformations, it is clear that only <sup>2</sup>H/D maintains anti-periplanarity with -Br, so in presence of a base will follow to eliminate -DBr only.

2. a)

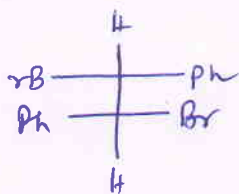


Substitution is likely follow SN' mechanism and generate the corresponding alcohol, after -Me migration to get the more stable Carbo cation

b)



c)



Do the same --- trans-isomer will be obtained.

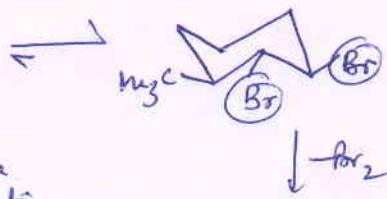
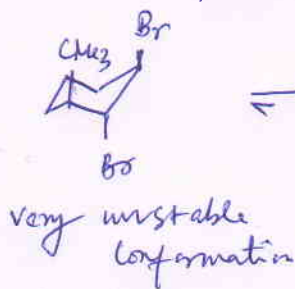
d)



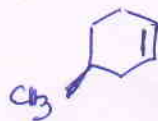
These two groups are maintaining anti-periplanarity. So upon treatment of base, HCl will be the elimination product.

Final product is

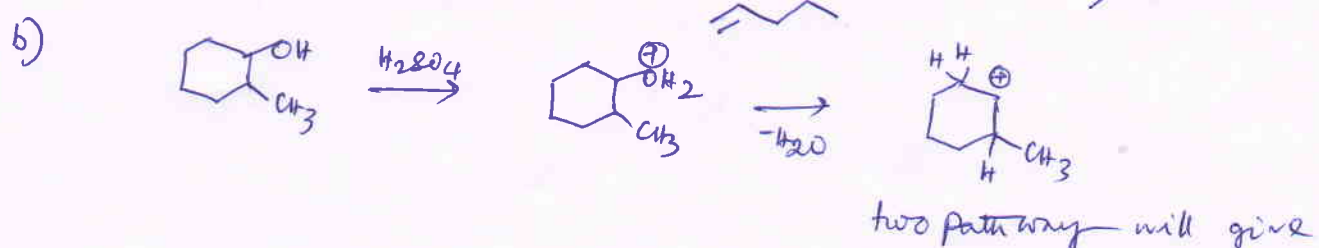
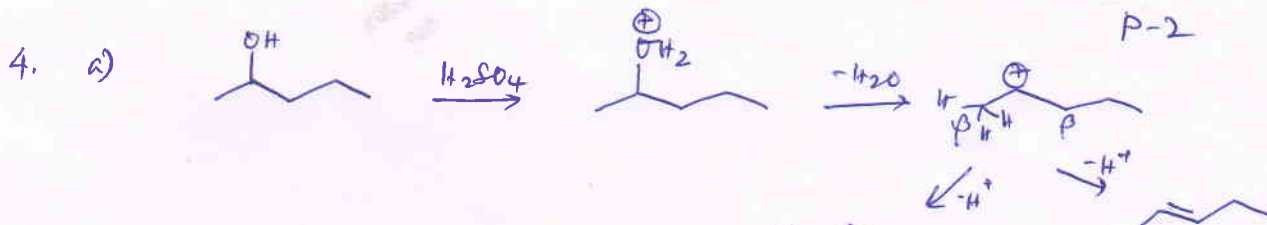
3.



These two groups maintain anti-periplanarity. Treating with I<sup>+</sup>, Br<sub>2</sub> will be eliminated



Two bigger groups are 'down' and sterically clashing, so this is a very unstable conformer. On the other hand, placing -Me group axially is not a valid option.



Third pt. is upon elimination pt. 5  
Carbocation rearrangement, via hydride migration

